

IN THE SPECIFICATION:

Please amend paragraphs 0013-0032, 0034-0049, 0066, 0073, 0085, 0090, 0096, 0099, 0115, 0116, 0125, 0126, 0130, 0131, and 0139 of the specification as follows:

Page 3, lines 17-24

[0013] The flexible tube according to a first aspect of the present invention ~~as set forth in Claim 1~~ is a flexible tube to be disposed on an exhaust path for exhaust gas from an engine, the tube including an outer bellows that is an outer tube having a flexible part with bellows, and an inner bellows that is an inner tube having a flexible part with bellows, the inner tube being fixed to one open end part of the outer bellows, wherein a gap as a buffering space is provided between bottoms of the pleats of the outer bellows and tops of the pleats of the inner bellows.

Page 4, line 24 to page 4, line 6

[0014] According to the first aspect of the invention ~~of Claim 1~~, by providing a gap as a buffering space between bottoms of the pleats of the outer bellows and tops of the pleats of the inner bellows, the amounts of exhaust noise and heat released from the inner bellows are suppressed by the buffering space, thus durability of the outer bellows is improved, and the amounts of exhaust sound and heat released from the outer bellows can be reduced. In addition, in a case of a flexible tube disposed upstream of the catalytic converter, the lowering of the temperature of the exhaust gas to be fed into the catalytic converter is suppressed, leading to quick temperature rise of the exhaust gas to be fed into the catalytic converter, thus resulting in improved capability to purify exhaust gas.

Page 4, lines 7-13

[0015] ~~The invention according to Claim 2~~ A second aspect of the invention is a flexible tube according to ~~Claim 1~~ the first aspect, wherein an overlapping space is provided where the inner bellows and an auxiliary pipe overlap each other, the inner bellows being fixed to an exhaust gas inlet of the outer bellows and extending toward an exhaust gas outlet thereof, the auxiliary pipe being fixed to the exhaust gas outlet of the outer bellows and extending toward the exhaust gas inlet; and an interference prevention member is held in the overlapping space.

Page 4, lines 14-19

[0016] According to the second aspect of the invention of ~~Claim 2~~, by holding the interference prevention member in the overlapping space between the inner bellows and the auxiliary pipe, the interference between the outer bellows and the inner bellows is avoided, the vibration of the outer bellows is absorbed, the stress in the inner bellows caused by heat is resolved, and thus durability of the inner bellows is improved.

Page 4, lines 20-23

[0017] ~~The invention according to Claim 3~~ A third aspect of the invention is a flexible tube according to ~~Claim 2~~ the second aspect of the invention wherein the interference prevention member is positioned utilizing a plurality of protrusions formed in the overlapping space for determining a longitudinal position thereof.

Page 4, line 24 to page 5, line 1

[0018] According to the third aspect of the invention of ~~Claim 3~~, by holding the interference prevention member between the protrusion formed on the outer periphery of the

inner bellows and the protrusion formed on the inner periphery of the auxiliary pipe, the longitudinal position is guided. Alternatively, the longitudinal positioning of the interference prevention member is guided by holding the interference prevention member between two protrusions formed on the inner bellows, or two protrusions formed on the auxiliary pipe.

Page 5, lines 2-3

[0019] The invention according to ~~Claim 4~~ a fourth aspect is a flexible tube according to ~~Claim 2~~ the second aspect wherein the interference prevention member is made of mesh wire.

Page 5, lines 4-9

[0020] According to the ~~invention of Claim 4~~ fourth aspect of the invention, by making the interference prevention member of mesh wire, sound insulation effect is improved, the difference in expansion between the outer bellows and the inner bellows caused by high temperature is easily absorbed and the generation of stress is suppressed, leading to improvement in durability and absorption of the vibration.

Page 5, lines 10-12

[0021] The invention according to ~~Claim 5~~ a fifth aspect is a flexible tube according to ~~Claim 4~~ the first aspect wherein the pleats of the inner bellows are smaller in depth and pitch than those of the outer bellows.

Page 5, lines 13-19

[0022] According to the ~~invention of Claim 5~~ fifth aspect of the invention, by configuring a double structure tube with the pleats of the bellows of the inner bellows being smaller in depth and pitch than those of the outer bellows, the flexible tube becomes compact with a high packing degree. Moreover, since the flexibility is fully maintained and turbulence in the exhaust gas is suppressed, the loss of the flow is reduced, leading to the improvement in the flow efficiency and thus in the output of the engine.

Page 5, lines 20-25

[0023] The invention according to ~~Claim 6~~ a sixth aspect is a flexible tube according to ~~Claim 4~~ the first aspect wherein an overlapping space is provided where the outer bellows and the inner bellows overlap each other, the outer bellows being fixed to an outlet of the exhaust gas from the engine and the inner bellows extending toward an exhaust gas outlet, and an interference prevention member is held in the above-mentioned overlapping space.

Page 5, line 26 to page 6, line 2

[0024] According to the ~~invention of Claim 6~~ sixth aspect of the invention, by providing the overlapping space where the outer bellows and the inner bellows overlap each other, no auxiliary pipe is necessary and the structure becomes simple, and therefore the loss of the flow is reduced, leading to the improvement in the flow efficiency and the increase in the output of the engine, not to mention the reduction in cost.

Page 6, lines 3-5

[0025] The invention according to ~~Claim 7~~ a seventh aspect is a flexible tube according to ~~Claim 6~~ the sixth aspect wherein the interference prevention member held in the overlapping space has a nearly circular cross section.

Page 6, lines 6-12

[0026] According to the ~~invention of Claim 7~~ seventh aspect of the invention, by making the cross section of the interference prevention member a nearly circle, sound insulation effect is improved, the exhaust efficiency is improved, and thus the output performance of the engine is increased. In addition, durability against free bend, shear and the like is improved. Moreover, the temperature of the exhaust gas reaching the outer bellows, which is generally high, is suppressed, leading to the improvement in durability of the flexible tube.

Page 6, lines 13-20

[0027] The invention according to ~~Claim 8~~ an eighth aspect is a flexible tube according to ~~Claim 1~~ the first aspect wherein an overlapping space is provided where the inner bellows and an auxiliary pipe overlap each other, the inner bellows being fixed to the exhaust gas inlet of the outer bellows and extending toward the exhaust gas outlet, and the auxiliary pipe being fixed to the outlet of the outer bellows and extending toward the inlet, and the inner bellows and the auxiliary pipe in the overlapping space are disposed with a gap therebetween that allows them to slidably move relative to each other.

Page 6, lines 21-27

[0028] According to the ~~invention of Claim 8~~ eighth aspect of the invention, by disposing the auxiliary pipe and the inner bellows with a gap therebetween that allows them to slidably move relative to each other, the difference in expansion between the outer bellows and the inner bellows caused by high temperature is easily absorbed, and the generation of stress is suppressed. In addition, the temperature of the exhaust gas reaching the outer bellows, which is generally high, is suppressed, leading to the improvement in durability of the flexible tube.

Page 6, line 28 to page 7, line 9

[0029] The invention according to ~~Claim 9~~ a ninth aspect is a flexible tube according to ~~Claim 1 or 2~~ the first or second aspect wherein the overlapping space is rotatably and slidably configured to have an interference prevention member provided between an auxiliary pipe and an outer periphery of the other end part of the inner bellows, in such a manner that permits the interference prevention member to slide in axial directions; and wherein the interference prevention member includes an outer spherical surface having a radius R with a center thereof aligned on an axis of the inner bellows, and the outer spherical surface overlaps and rotatably engages with an inner spherical surface provided in the auxiliary pipe, the inner spherical surface having a radius R with a center thereof aligned on the axis of the inner bellows.

Page 7, lines 10-16

[0030] According to the ~~invention of Claim 9~~ ninth aspect of the invention, by providing a rotatable overlapping space by providing the outer spherical surface (also referred to as “male form”) having a radius R with the center thereof aligned on the axis of the inner

bellows and the inner spherical surface (also referred to as “female form”) of the auxiliary pipe, durability against tensile, compression, free bend, shear and the like is remarkably improved, leading to the flexible tube with prolonged life.

Page 7, lines 17-25

[0031] The invention according to ~~Claim 10~~ a tenth aspect is a flexible tube according to any one of ~~Claims 2, 6 and 7~~ second, sixth, and seventh aspects wherein the inner bellows is separated into a plurality of pieces; on one end part of each piece, an outer spherical surface is provided so as to have a radius R with the center thereof aligned on the axis of the inner bellows; on the other end part of the adjacent inner bellows piece, an inner spherical surface is provided so as to have a radius R with the center thereof aligned on the axis of the inner bellows; and the outer spherical surface and inner spherical surface pivotally support each other to provide a spherical joint that can rotatably slide.

Page 7, line 26 to page 8, line 1

[0032] According to the ~~invention of Claim 10~~ tenth aspect of the invention, by separating the inner bellows into a plurality of pieces and by providing a rotatable and slidable spherical joint formed of the outer spherical surface and the inner spherical surface on the end parts of the pieces, durability against to free bend and shear is remarkably improved, leading to the flexible tube with prolonged life.

Page 8, lines 7-15

[0034] The invention according to ~~Claim 11~~ an eleventh aspect is a flexible tube according to ~~Claim 9~~ the ninth aspect wherein the inner bellows is separated into a plurality

of pieces; on one end part of each piece, an outer spherical surface is provided so as to have a radius R with the center thereof aligned on the axis of the inner bellows; on the other end part of the adjacent inner bellows piece, an inner spherical surface is provided so as to have a radius R with the center thereof aligned on the axis of the inner bellows; and the outer spherical surface and inner spherical surface pivotally support each other to provide a spherical joint that can rotatably slide.

Page 8, lines 16-21

[0035] According to the ~~invention of Claim 11~~ eleventh aspect of the invention, by separating the inner bellows into a plurality of pieces and by providing a plurality of rotatable and slidable spherical joints each formed of the outer spherical surface of the interference prevention member and the inner spherical surface, durability against free bend and shear is remarkably improved, leading to the flexible tube with prolonged life.

Page 8, line 22 to page 9, line 3

[0036] The invention according to ~~Claim 12~~ a twelfth aspect is a flexible tube according to ~~Claim 10~~ the tenth aspect wherein a ring-shaped interference prevention member is held on the outer periphery of the inner bellows; on the outer periphery of the interference prevention member, an outer spherical surface is provided so as to have a radius R with the center thereof aligned on the axis of the inner bellows; on the other end part of the adjacent inner bellows, an inner spherical surface is provided so as to have a radius R with the center thereof aligned on the axis of the inner bellows; and the outer spherical surface of the interference prevention member and the inner spherical surface of the inner bellows pivotally support each other to provide a spherical joint that can rotatably slide.

Page 9, lines 4-14

[0037] According to the ~~invention of Claim 12~~ twelfth aspect of the invention, by providing the outer spherical surface having a radius R on the outer periphery of the ring-shaped interference prevention member, and by providing a rotatable and slidable spherical joint formed of the interference prevention member held by one end part of the inner bellows and the inner spherical surface on the other end part of the adjacent inner bellows, sound insulation effect of the interference prevention member is improved, the generation of stress in the outer bellows and the inner bellows at high temperature is suppressed, the vibration is absorbed, and durability against free bend, shear and the like is remarkably improved, leading to amplified effects and the flexible tube with prolonged life.

Page 9, lines 15-17

[0038] The invention according to ~~Claim 13~~ a thirteenth aspect is a flexible tube according to ~~Claim 12~~ the twelfth aspect wherein a plurality of the spherical joints is provided on the inner bellows.

Page 9, lines 18-21

[0039] According to the ~~invention of Claim 13~~ thirteenth aspect of the invention, by providing a plurality of the spherical joints on the inner bellows, the generation of the stress is suppressed, the vibration is absorbed, and durability against free bend, shear and the like is remarkably improved.

Page 9, lines 22-24

[0040] The invention according to ~~Claim 14~~ a fourteenth aspect is a flexible tube according to ~~Claim 10~~ the tenth aspect wherein a plurality of the spherical joints is provided on the inner bellows.

Page 9, lines 25-28

[0041] According to the invention of ~~Claim 14~~ fourteenth aspect of the invention, by providing a plurality of the spherical joints on the inner bellows, the generation of the stress is suppressed, the vibration is absorbed, and durability against free bend, shear and the like is remarkably improved.

Page 9, line 29 to page 10, line 2

[0042] The invention according to ~~Claim 15~~ a fifteenth aspect is a flexible tube according to ~~Claim 1~~ the first aspect wherein a partition is disposed that splits the exhaust path in a direction from the exhaust gas inlet to the exhaust gas outlet.

Page 10, lines 3-5

[0043] According to the invention of ~~Claim 15~~ fifteenth aspect of the invention, by providing a flexible part on a partition that splits the exhaust path of the inner bellows, the partition steady and flexibly accommodates the displacement of the inner bellows.

Page 10, lines 6-9

[0044] The invention according to ~~Claim 16~~ a sixteenth aspect is a flexible tube according to ~~Claim 15~~ the fifteenth aspect wherein the partition has adhesive surfaces for

attaching to the inner periphery of the inner bellows, and has a flexible part for allowing the partition to freely displace.

Page 10, lines 10-13

[0045] According to the ~~invention of Claim 16~~ sixteenth aspect of the invention, by providing the partition with a flexible part for allowing the partition to freely displace, which flexible part includes bellows in the form of plate formed of steel plate having spring property, free displacement of the main body of the inner bellows is allowed.

Page 10, lines 14-17

[0046] The invention according to ~~Claim 17~~ a seventeenth aspect is a flexible tube according to ~~Claim 16~~ the sixteenth aspect wherein the flexible part for allowing the partition to freely displace includes bellows in the form of plate formed of steel plate having spring property.

Page 10, lines 18-21

[0047] According to the ~~invention of Claim 17~~ seventeenth aspect of the invention, by providing bellows in the form of plate formed of steel plate having spring property, turbulence in the exhaust gas is suppressed, the loss of the flow is reduced, leading to the improvement in the flow efficiency and thus in the output of the engine.

Page 10, lines 22-28

[0048] The invention according to ~~Claim 18~~ an eighteenth aspect is a flexible tube according to ~~Claim 16~~ the sixteenth aspect wherein the flexible part for allowing the partition

to freely displace includes a plurality of steel plates having spring property, one end part thereof being fixed to the partition on the inlet side in such a manner that the partition is clamped by the steel plates, and the other end part thereof holding the partition on the outlet side in such a manner that the partition is clamped by the steel plates.

Page 10, line 29 to page 11, line 10

[0049] According to the invention of ~~Claim 18~~ eighteenth aspect of the invention, instead of by providing a bellows in the form of a plate, by providing the flexible part including two steel plates having spring property, one end part thereof being fixed to the partition on the inlet side in such a manner that the partition is clamped by the two steel plates, and the other end part thereof holding the partition on the outlet side in such a manner that the partition is clamped by the two steel plates, expensive bellows is not necessary, and an inexpensive flexible part can be introduced easily. Moreover, as compared with the flexible tube having a flexible part with bellows, turbulence in the exhaust gas is suppressed and the loss of the flow is reduced, leading to the improvement in the flow efficiency and thus in the output of the engine.

Page 14, lines 12-20

[0066] To the ring-shaped space created by the difference in size between the inner diameter $\phi d1$ and the outer diameter $\phi d2$ in the overlapping space a, an interference prevention member 6 is fitted. The longitudinal position of the interference prevention member 6 is guided by two protrusions 4d and 5d, ~~as claimed in Claim 3~~. The protrusion 4d is formed in the vicinity of the right end part of the outer periphery of the inner bellows 4.

The protrusion 5d is formed in the vicinity of the left end part of the inner periphery of the auxiliary pipe 5. These two serves to position the interference prevention member.

Page 15, line 21 to page 16, line 6

[0073] For example, as shown in Figs. 8(a) and (b), the upstream (left end in the figure) of the flexible tube 10 is connected to the exhaust manifold M1 and the downstream (right end in the figure) is connected to the catalytic converter C. The buffering space S with the gap t relative to the inner diameter of the outer bellows 3 (see Fig. 1(a)) is also provided around the overlapping space a ~~as claimed in Claim 2~~ in which the inner bellows 4 and the auxiliary pipe 5 overlap each other. In the overlapping space a , the inner bellows 4 and the auxiliary pipe 5 overlap each other with the sufficient gap in the radial direction and with the sufficient length in the axial direction, and the interference prevention member 6 is held on to fit the gap provided in the overlapping space a . The longitudinal position of the interference prevention member 6 is guided by means of one protrusion 4d formed in the right end part of the inner bellows 4 on the outer periphery and one protrusion 5d formed in the right end part of the auxiliary pipe 5 on the inner periphery.

Page 18, lines 21-27

[0085] Fig. 1(d) shows a half sectional view of a flexible tube 10c according to a fourth embodiment of the present invention ~~as claimed in Claim 8~~. As shown in Fig. 1(d), the protectors 1,1, the outer blade 2 and the outer bellows 3 are omitted, as in Fig. 1(c), but in practice, the tube has a similar structure to that shown in Fig. 1(b). In this fourth embodiment, the spherical joints F, G, which are the same as those illustrated Fig. 1(c), are designated with the same reference characters, and thus a duplicate description is omitted.

Page 19, line 26 to page 20, line 4

[0090] Fig. 2(a) shows a half sectional view of a flexible tube 20 according to a fifth embodiment of the present invention ~~as claimed in Claim 2~~. The flexible tube 20 shown in Fig. 2(a) will now be described only with respect to the differences from Fig. 1. Those parts corresponding to the components of Fig. 1 are identified with the same reference characters. As shown in Fig. 2(a), the flexible tube 20 includes protectors 11,11, an outer blade 2, an outer bellows 13, an inner bellows 14, an auxiliary pipe 15, and an interference prevention member 16.

Page 21, lines 10-18

[0096] Fig. 2(b) shows a half sectional view of a flexible tube 20a according to a sixth embodiment of the present invention ~~as claimed in Claim 10~~. As shown in Fig. 2(b), the flexible tube 20a includes protectors 11,11, an outer blade 2, an outer bellows 13, an inner bellows 14 and an interference prevention member 16a. The inner bellows 14 is separated into two parts, 14e and 14f. The right end part of the inner bellows 14e and the left end part of the inner bellows 14f pivotally support each other to provide a spherical joint F that can rotatably slide. The interference prevention member 16a has a nearly circular cross section.

Page 22, lines 6-12

[0099] Fig. 2(c) shows a half sectional view of a flexible tube 20b according to a seventh embodiment of the present invention ~~as claimed in Claim 11~~. In Fig. 2(c), the protectors 11,11, the outer blade 2 and the outer bellows 13 are omitted, but in practice, the tube has a similar structure to that shown in Fig. 2(b). In this seventh embodiment, spherical

joints Fa and Ga are provided, which have different structures from that of the spherical joint F shown in Fig. 2(b).

Page 25, lines 11-19

[0115] Fig. 3(d) relates to one embodiment ~~as claimed in Claim 3~~, and shows a sectional view of a modified embodiment of the interference prevention member 6 in the overlapping space b shown in (a) and (b). As shown in Fig. 3(d), the interference prevention member 6 can be positioned utilizing two protrusions 25d, 25d on the inner periphery of the auxiliary pipe 25 in the overlapping space b. Alternatively, as shown in Fig. 3(a), the interference prevention member 6 can be positioned utilizing two protrusions 14d, 14d, or utilizing the combination of the protrusion 14d and the recess 25d, as shown in Fig. 3(b).

Page 25, line 21 to page 26, line 8

[0116] Fig. 3(c) relates to one embodiment ~~as claimed in Claim 11~~, showing a sectional view of the flexible tube 30b according to an eleventh embodiment. As shown in Fig. 3(c), the protectors 11, 11, the outer blade 2 and the outer bellows 13 as in Fig. 3(a) are omitted, but in practice, the tube 30b has a similar structure to that shown in Fig. 3(a). In this eleventh embodiment, a buffering space S is provided between the outer bellows 2 and the inner bellows 14 (see Fig. 3(a)). An interference prevention member 16f is held in the overlapping space b where the inner bellows 14 and the auxiliary pipe 25 overlap each other. In the overlapping space b, the auxiliary pipe 25 having an inner spherical surface provided thereon and the inner bellows 14 are allowed to rotatably or slidably move relative to each other, with the interference prevention member 16f placed therebetween. The inner bellows 14 is separated into a plurality of pieces and has a spherical joint Fd and an outer spherical

surface is provided on the interference prevention member 16f on the adjacent inner bellows. The outer spherical surface and the inner spherical surface pivotally support each other to provide a spherical joint Gd that can rotatably slide.

Page 28, lines 19-29

[0125] Fig. 4(c) relates to one embodiment as ~~claimed in Claim 7~~, showing a half sectional view of a flexible tube 40b according to a fourteenth embodiment of the present invention. The flexible tube 40b shown in Fig. 4 will now be described only with respect to the differences from Figs. 4(a) and 4(b). Those parts corresponding to the components of Figs. 4(a) and (b) are identified with the same reference characters. As shown in Fig. 4(c), the interference prevention member 36 has a nearly circular cross section, and the inner periphery of the interference prevention member 36 is abutted by the outer periphery of the inner bellows 24f. In addition, the interference prevention member 36 is held in the groove of the recess 35a provided on the auxiliary pipe 35.

Page 29, lines 2-8

[0126] Fig. 5 relates to embodiments as ~~claimed in Claims 15-18~~, and Fig. 5(a) shows a half sectional plan view of a flexible tube 50 according to a fifteenth embodiment, (b) shows a partially sectional front view, and (c) shows a left side view of (b). The flexible tube 50 shown in Fig. 5 will now be described only with respect to the differences from Figs. 1 and 2. Those parts corresponding to the components of Figs. 1 and 2 are identified with the same reference characters.

Page 29, line 23 to page 30, line 2

[0130] With respect to the embodiment shown in Fig. 5(b), ~~which relates to~~
~~embodiments as claimed in Claims 16 and 17,~~ a flexible part d has a bellows 17a in the form
of plate made of steel having spring property for allowing free displacement of the partition.
The bellows 17a on the partition 17 is in the form of a plate and both end parts of the partition
are attached to the inner periphery of the inner bellows 14. As a result, turbulence in the
exhaust gas can be adjusted to laminar flow and the loss of the flow is reduced, leading to the
improvement in the flow efficiency and in the output of the engine E. In other words, output
performance can be increased.

Page 30, lines 3-4

[0131] Fig. 5(d) relates to one embodiment ~~as claimed in Claim 18,~~ showing a
modified embodiment of the flexible part d of (b).

Page 31, line 27 to page 32, line 4

[0139] Fig. 6 relates to ~~embodiments as claimed in Claims 6, 15—18,~~ and Fig. 6(a)
shows a half sectional plan view of a flexible tube 60 according to a sixteenth embodiment of
the present invention, (b) shows a partially sectional front view, and (d) shows a left side
view of (b). The flexible tube 60 shown in Fig. 6 will now be described only with respect to
the differences from Fig. 5. Those parts corresponding to the components of Fig. 5 are
identified with the same reference characters.